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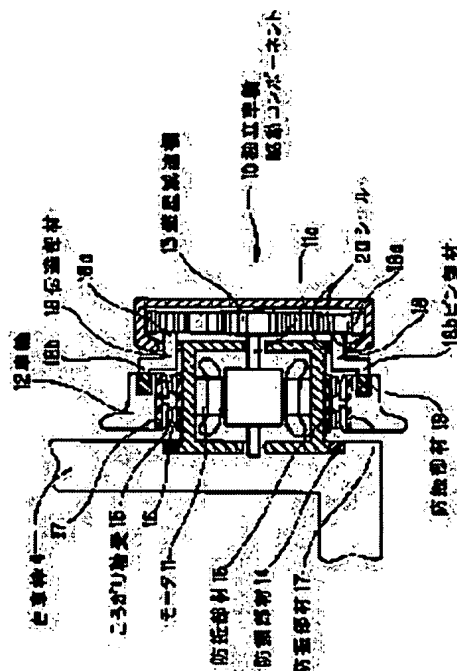
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## (54) INDEPENDENT WHEEL DRIVE COMPONENT FOR RAIL CAR

(57)Abstract:

**PROBLEM TO BE SOLVED:** To reduce transmission of vibration generated at a wheel to a speed reduction gear and a motor as well as surely transmit torque from the motor to the wheel.

**SOLUTION:** In this component a wheel 12 is disposed free to rotate around a motor 11, and torque of the motor 11 is reduced by a planetary reduction gear 13 and transmitted to the wheel 12 by way of transmission members 18. A plurality of penetrating holes 12a are formed in the wheel 12 and pin members 18b of the transmission members 18 penetrate into the penetrating holes. Between the penetrating holes and the pin members 18b, vibration isolating members 19 are interposed. Between the motor 11 and the wheel 12, vibration isolating members 16, 17 are interposed. The torque of the motor 11 compresses the vibration isolating members 19 and is surely transmitted to the wheel 11. On the other hand, vibration generated at the wheel 12 is reduced by the vibration isolating members 16, 17, 19.



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**CLAIMS**

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[Claim(s)]

[Claim 1] The right-hand side wheel and the left-hand side wheel which have been arranged in the truck frame achieve individual and independence, and it rotates. In the condition of enclosing the periphery section of the motor which is the independent-wheel drive component which uses each wheel for the independent-wheel driving truck driven by the motor according to individual, and was supported by said truck frame The wheel arranged free [ rotation ] through antifriction bearing, and the reducer with which coaxial arrangement was carried out in the location which shifted to shaft orientations to said motor, and the input side was connected with the output shaft of said motor, While an end side is connected with the penetrating hole formed in \*\* [ location / on the periphery centering on a revolving shaft ] among the side faces of said wheel at the output side of said reducer The transfer member which has two or more pin members which intrude, respectively in said penetrating hole at an other end side, Between the vibrationproofing member made to intervene between the pin member of said transfer member, and said penetrating hole, and said motors and said antifriction bearing, Or the independent-wheel drive component for rail cars characterized by consisting of vibrationproofing members made to be placed at least between one side between said wheels and said antifriction bearing.

[Claim 2] The right-hand side wheel and the left-hand side wheel which have been arranged in the truck frame achieve individual and independence, and it rotates. In the condition of enclosing the periphery section of the motor which is the independent-wheel drive component which uses each wheel for the independent-wheel driving truck driven by the motor according to individual, and was supported by said truck frame The wheel arranged free [ rotation ] through antifriction bearing, and the reducer with which coaxial arrangement was carried out in the location which shifted to shaft orientations to said motor, and the input side was connected with the output shaft of said motor, While an end side is connected with the circular penetrating hole formed in \*\* [ location / on the periphery centering on a revolving shaft ] among the side faces of said wheel at the output side of said reducer The transfer member which has the pin member of the shape of two or more cylinder which intrudes, respectively in said penetrating hole at an other end side, Between the vibrationproofing member of the shape of a ring made to intervene between the pin member of said transfer member, and said penetrating hole, and said motors and said antifriction bearing, Or the independent-wheel drive component for rail cars characterized by consisting of vibrationproofing members made to be placed at least between one side between said wheels and said antifriction bearing.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the independent-wheel drive component for rail cars. In this invention, while torque transmission to a motor empty vehicle ring is made certainly, it devises so that it can reduce that a radial vibration generated from the wheel transmits to a reducer or a motor.

[0002]

[Description of the Prior Art] In the driving truck for [ current ] many rail cars, the right-hand side wheel and the left-hand side wheel have adopted the one apparatus wheel connected with the axle, and are running by slowing down with a reducer the driving force of the motor with which the truck was equipped, and transmitting it to an one apparatus wheel. When running a curvilinear orbit, curvilinear transit is possible by the self steering effectiveness of having used the tread of a wheel.

[0003] On the other hand, recently, in order to adopt low-floor structure etc., the independent-wheel driving truck is developed. In this independent-wheel driving truck, while making it the configuration which omits an axle, achieves individual and independence of a right-hand side wheel and the left-hand side wheel, and is rotated, each wheel is driven by the motor according to individual. In this independent-wheel driving truck, if whenever [ on either side wheel speed ] is made the same, like an one apparatus wheel, curvilinear transit of the curvilinear orbit can be carried out according to the above-mentioned self steering effectiveness, and also curvilinear transit of the curvilinear orbit can be carried out by changing whenever [ on either side wheel speed ].

[0004]

[Problem(s) to be Solved by the Invention] By the way, in the independent-wheel driving truck, the wheel was adjoined and the reducer and the motor are arranged. For this reason, the life was [ that a radial vibration produced in case a wheel runs an orbit transmits to a reducer or a motor directly, and receives vibration with big reducer and motor, and a reducer and a motor tend to deteriorate ] short.

[0005] It aims at offering the independent-wheel drive component for rail cars which can reduce that a radial vibration generated from the wheel transmits it to a reducer or a motor while this invention can do certainly torque transmission to a motor empty vehicle ring in view of the above-mentioned conventional technique, and can reduce vibration and degradation of a reducer and a motor.

[0006]

[Means for Solving the Problem] The right-hand side wheel and the left-hand side wheel which have been arranged in the truck frame achieve individual and independence of the configuration of this invention which solves the above-mentioned technical problem, and it is rotated. In the condition of enclosing the periphery section of the motor which is the independent-wheel drive component which uses each wheel for the independent-wheel driving truck driven by the motor according to individual, and was supported by said truck frame The wheel arranged free [ rotation ] through antifriction bearing, and the reducer with which coaxial arrangement was carried out in the location which shifted to shaft orientations to said motor, and the input side was connected with the output shaft of said motor, While an end side is connected with the penetrating hole formed in \*\* [ location / on the periphery centering on a revolving shaft ] among the side faces of said wheel at the output side of said reducer The transfer member which has two or more pin members which intrude, respectively in said penetrating hole at an other end side, It is characterized by consisting of

vibrationproofing members made placed between the vibrationproofing member made to intervene between the pin member of said transfer member, and said penetrating hole, and said motor and said antifriction bearing, or between either [ at least ] between said wheels and said antifriction bearing. [0007] Moreover, the right-hand side wheel and the left-hand side wheel which have been arranged in the truck frame achieve individual and independence of the configuration of this invention, and it is rotated. In the condition of enclosing the periphery section of the motor which is the independent-wheel drive component which uses each wheel for the independent-wheel driving truck driven by the motor according to individual, and was supported by said truck frame The wheel arranged free [ rotation ] through antifriction bearing, and the reducer with which coaxial arrangement was carried out in the location which shifted to shaft orientations to said motor, and the input side was connected with the output shaft of said motor, While an end side is connected with the circular penetrating hole formed in \*\* [ location / on the periphery centering on a revolving shaft ] among the side faces of said wheel at the output side of said reducer The transfer member which has the pin member of the shape of two or more cylinder which intrudes, respectively in said penetrating hole at an other end side, It is characterized by consisting of vibrationproofing members made placed between the vibrationproofing member of the shape of a ring made to intervene between the pin member of said transfer member, and said penetrating hole, and said motor and said antifriction bearing, or between either [ at least ] between said wheels and said antifriction bearing.

[0008]

[Embodiment of the Invention] The gestalt of operation of this invention is explained at a detail based on a drawing below.

[0009] Drawing 1 is the block diagram showing the independent-wheel driving truck equipped with the independent-wheel drive component concerning the gestalt of operation of this invention, drawing 2 is the sectional view showing the independent-wheel drive component concerning the gestalt of this operation, drawing 3 is drawing of longitudinal section of a wheel, and drawing 4 is the top view showing a vibrationproofing member.

[0010] As shown in drawing 1 , on the independent-wheel driving truck 1 for rail cars, a car body 3 is carried through an air spring 2. The right-hand side and on the left-hand side of the independent-wheel driving truck 1, individual and independence are achieved and the motors 11 and 11 of the right and left which carry out a rotation drive are arranged. [ of the truck frame 4 ] Wheels 12 and 12 are arranged through antifriction bearing at the periphery section of the motors 11 and 11 on either side, respectively. The driving force of motors 11 and 11 is transmitted to wheels 12 and 12 through the planet reducers 13 and 13. Thus, it can run a rail 5 top by carrying out the rotation drive of the wheels 12 and 12 according to an individual by the motors 11 and 11 with which the left-hand side and right-hand side of the truck frame 4 were equipped.

[0011] The independent-wheel drive components 10 including the above-mentioned motor 11, a wheel 12, and the planet reducer 13 are constituted. This independent-wheel drive component 10 is explained below with reference to drawing 2 - drawing 4 .

[0012] As shown in drawing 2 , as for the motor 11, the end face is fixed and supported by the truck frame 4. And the vibrationproofing member 14 is infixed between the periphery of the end face of a motor 11, and the truck frame 4. This vibrationproofing member 14 serves as a configuration as shown in drawing 4 , and serves as a configuration corresponding to the peripheral shape of the end face of a motor 11. That is, since the projection of pitch \*\*\*\*\* and a baffle is formed in the periphery of the end face of a motor 11 90 degrees, it combines with this projection and height 14a is formed also in the vibrationproofing member 14.

[0013] The wheel 12 is arranged free [ rotation ] through antifriction bearing 15 at the periphery section of a motor 11. That is, the wheel 12 is arranged in the condition of enclosing the periphery section of a motor 11. And the vibrationproofing member 16 is infixed between the peripheral face of a motor 11, and the inner ring of spiral wound gasket of antifriction bearing 15, and the vibrationproofing member 17 is infixed between the inner skin of a wheel 12, and the outer ring of spiral wound gasket of antifriction bearing 15.

[0014] The planet reducer 13 is the location which shifted to the outside (outside of the cross direction) of shaft orientations to the motor 11, and it is arranged so that it may become the revolving shaft of a motor 11, and the same axle. As for this planet reducer 13, the input side is connected with

output-shaft 11a of a motor 11.

[0015] On the other hand, as shown in drawing 3, circular penetrating hole 12a [ two or more (the gestalt of this operation four pieces) ] is formed in the side face of a wheel 12. Each penetrating hole 12a is formed at \*\* [ location / on the periphery centering on the revolving shaft of a wheel 12 ] (90-degree pitch \*\*\*\*\*).

[0016] If return explanation is given at drawing 2, the transfer member 18 is arranged in the location between the planet reducer 13 and a wheel 12. That end flank part ( drawing 2 right-hand side part) 18a is connected with the output side of the planet reducer 15, and, as for this transfer member 18, it has pin member 18b of the shape of two or more cylinder (the gestalt of this operation 4) in that other end side ( drawing 2 left-hand side). 90-degree pitch gap \*\*\*\*\* of the \*\* pin (4) member 18b is carried out, and penetrating is carried out to penetrating hole 12a formed in the wheel 12, respectively.

[0017] Furthermore, as shown in drawing 2 and drawing 3, the ring-like vibrationproofing member 19 is infixed between penetrating hole 12a and pin member 18b.

[0018] As each vibrationproofing members 14, 16, 17, and 19, the rubber whose degree of hardness is about 60 degrees is used.

[0019] Moreover, the seal 20 is formed in the opening at the planet reducer 13.

[0020] By the independent-wheel drive component 10 which has the above-mentioned composition, if a motor 11 carries out a rotation drive, turning effort will be slowed down with the planet reducer 13, and will be transmitted to a wheel 12 through the transfer member 18, and a wheel 12 will rotate it. In case driving force transmits to the transfer member 18 empty-vehicle ring 12, the vibrationproofing member 19 between pin member 18b and penetrating hole 12a is compressed by the hoop direction. To compressive force, since it is strong, as for the vibrationproofing member 19, driving force is certainly transmitted to a wheel 12.

[0021] On the other hand, transit of a wheel 12 on a rail generates vibration in radial [ of a wheel 12 ]. A vibration radial [ this ] is transmitted to a motor 11, after vibration is mainly reduced by the vibrationproofing members 16 and 17. For this reason, a radial vibration which occurs from a wheel 12 and is transmitted to a motor 11 can be reduced, and failure and degradation of a motor 11 can reduce it, and it can prolong a life.

[0022] Moreover, vibration of a wheel 12 is transmitted to the planet reducer 13 through the transfer member 18, after vibration is reduced by the vibrationproofing member 19. For this reason, vibration which occurs from a wheel 12 and is transmitted to the planet reducer 13 can be reduced, and failure and degradation of the planet reducer 13 can reduce it, and it can prolong a life.

[0023] Moreover, it can reduce that wheel vibration transmits to the planet reducer 13 or a motor 11 also by the vibrationproofing member 14. Moreover, it reduces that wheel vibration transmits to a truck 1 by the vibrationproofing member 14, as a result oscillating transfer into a car body 3 can be reduced, and it considers so that a degree of comfort may be improved. In addition, although it has the vibrationproofing member 14 with the gestalt of the above-mentioned implementation, it is good also as a configuration which is not equipped with the vibrationproofing member 14 depending on the case.

[0024] In addition, the configuration of penetrating hole 12a may not be circular, and is good also as a polygonal hole. In that case, while making pin member 18b into many prismatic forms, the vibrationproofing member 19 is made into a polygonal ring configuration.

[0025] Moreover, although it has the vibrationproofing member 16 and the vibrationproofing member 17 with the gestalt of the above-mentioned implementation, it is good also as a configuration between which a vibrationproofing member is made to be placed between a motor 11 and antifriction bearing 15 or in either [ at least ] between a wheel 12 and antifriction bearing 15.

[0026]

[Effect of the Invention] As concretely explained with the gestalt of operation above, the right-hand side wheel and the left-hand side wheel which have been arranged in the truck frame in this invention achieve individual and independence, and it rotates. In the condition of enclosing the periphery section of the motor which is the independent-wheel drive component which uses each wheel for the independent-wheel driving truck driven by the motor according to individual, and was supported by said truck frame The wheel arranged free [ rotation ] through antifriction bearing, and

the reducer with which coaxial arrangement was carried out in the location which shifted to shaft orientations to said motor, and the input side was connected with the output shaft of said motor, While an end side is connected with the penetrating hole formed in \*\* [ location / on the periphery centering on a revolving shaft ] among the side faces of said wheel at the output side of said reducer The transfer member which has two or more pin members which intrude, respectively in said penetrating hole at an other end side, It constituted from a vibrationproofing member made placed between the vibrationproofing member made to intervene between the pin member of said transfer member, and said penetrating hole, and said motor and said antifriction bearing, or between either [ at least ] between said wheels and said antifriction bearing.

[0027] Moreover, in this invention, the right-hand side wheel and the left-hand side wheel which have been arranged in the truck frame achieve individual and independence, and it rotates. In the condition of enclosing the periphery section of the motor which is the independent-wheel drive component which uses each wheel for the independent-wheel driving truck driven by the motor according to individual, and was supported by said truck frame The wheel arranged free [ rotation ] through antifriction bearing, and the reducer with which coaxial arrangement was carried out in the location which shifted to shaft orientations to said motor, and the input side was connected with the output shaft of said motor, While an end side is connected with the circular penetrating hole formed in \*\* [ location / on the periphery centering on a revolving shaft ] among the side faces of said wheel at the output side of said reducer The transfer member which has the pin member of the shape of two or more cylinder which intrudes, respectively in said penetrating hole at an other end side, It constituted from a vibrationproofing member made placed between the vibrationproofing member of the shape of a ring made to intervene between the pin member of said transfer member, and said penetrating hole, and said motor and said antifriction bearing, or between either [ at least ] between said wheels and said antifriction bearing.

[0028] It writes as the above-mentioned configuration, and in this invention, a radial vibration generated for the wheel can be reduced by the vibrationproofing member infixed between a motor and antifriction bearing or between a wheel and antifriction bearing, it can reduce that a radial vibration generated from the wheel transmits to a motor by this, and vibration and degradation of a motor can be reduced. Consequently, the life of a motor can be prolonged.

[0029] Moreover, in this invention, vibration generated for the wheel can be reduced by the vibrationproofing member infixed between the penetrating hole and the pin member, it can reduce that vibration generated from the wheel transmits to a reducer by this, and vibration and degradation of a reducer can be reduced. Consequently, the life of a reducer can be prolonged.

[0030] Moreover, since the vibrationproofing member between a pin member and a penetrating hole is compressed by the hoop direction in case driving force transmits to a transfer member empty vehicle ring, driving force is certainly transmitted to a wheel.

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**DESCRIPTION OF DRAWINGS**

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[Brief Description of the Drawings]

[Drawing 1] The block diagram showing the independent-wheel driving truck equipped with the independent-wheel drive component concerning the gestalt of operation of this invention.

[Drawing 2] The sectional view showing the independent-wheel drive component concerning the gestalt of operation of this invention.

[Drawing 3] The sectional view showing the longitudinal section of a wheel.

[Drawing 4] The top view showing a vibrationproofing member.

[Description of Notations]

- 1 Independent-Wheel Driving Truck
- 2 Air Spring
- 3 Car Body
- 4 Truck Frame
- 5 Rail
- 10 Independent-Wheel Drive Component
- 11 Motor
- 11a Output shaft
- 12 Wheel
- 13 Planet Reducer
- 14 Vibrationproofing Member
- 14a Height
- 15 Antifriction Bearing
- 16 Vibrationproofing Member
- 17 Vibrationproofing Member
- 18 Transfer Member
- 18a A part for an end flank
- 18b Pin member
- 19 Vibrationproofing Member
- 20 Seal

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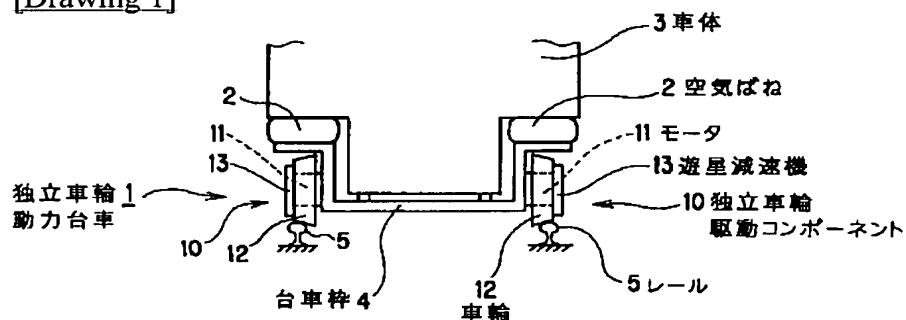
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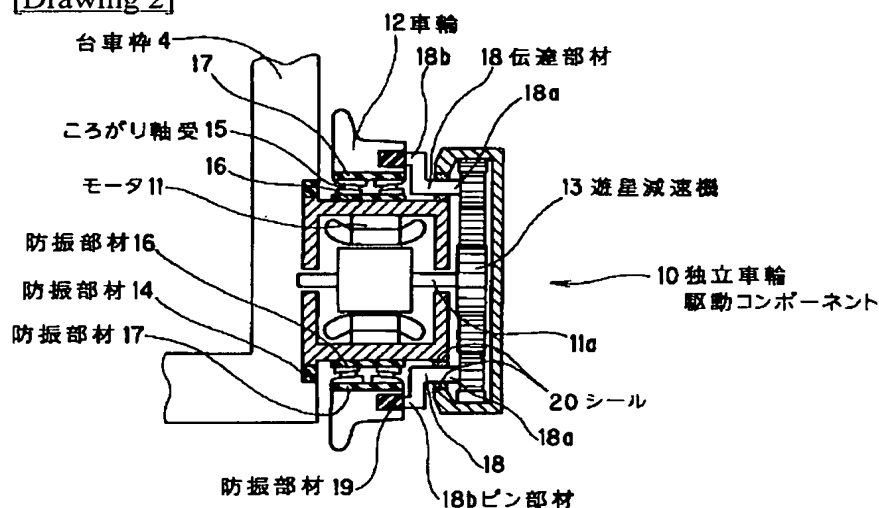
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## DRAWINGS

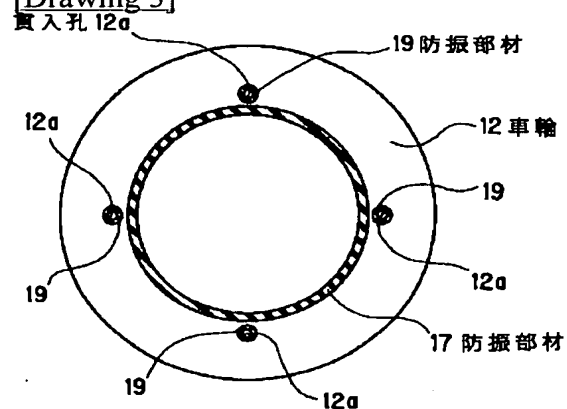
[Drawing 1]



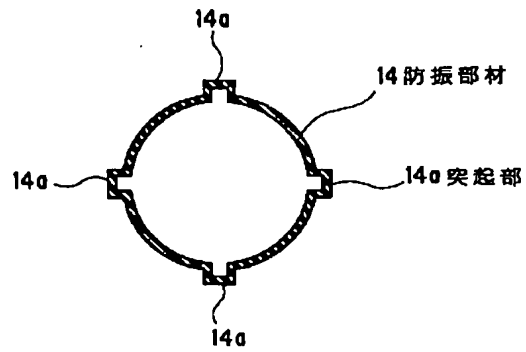
[Drawing 2]



[Drawing 3]



[Drawing 4]



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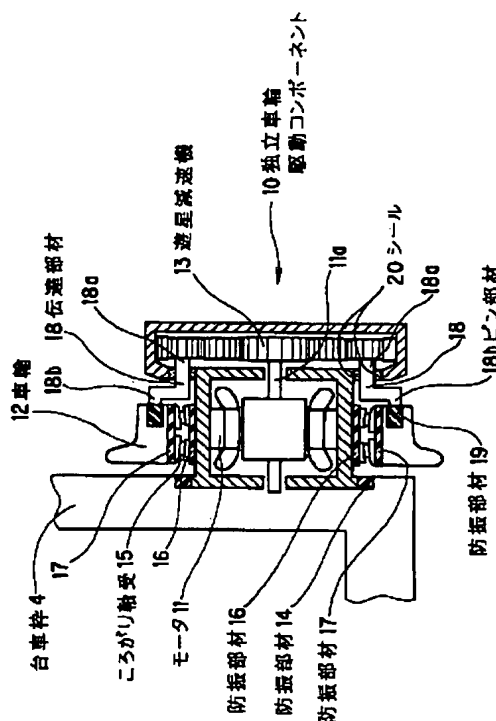
Fターム(参考) 3D035 DA02

(54)【発明の名称】 鉄道車両用の独立車輪駆動コンポーネント

(57)【要約】

【課題】 モータから車輪へのトルク伝達を確実にすると共に、車輪から発生する振動が減速機やモータに伝達するのを低減する。

【解決手段】 モータ11の周囲に車輪12が回転自在に配置されており、モータ11の回転力は、遊星減速機13にて減速され伝達部材18を介して、車輪12に伝達される。車輪12には複数の貫入孔12aが形成されており、伝達部材18のピン部材18bが貫入孔12aに貫入しており、貫入孔12aとピン部材18bとの間に、防振部材19が介在されている。モータ11と車輪12との間には、防振部材16、17が介在されている。モータ11からの回転力は、防振部材19を圧縮して車輪11に確実に伝達される。一方、車輪12に発生した振動は、防振部材16、17、19により低減される。



## 【特許請求の範囲】

【請求項 1】 台車枠に配置した右側の車輪と左側の車輪とが個別・独立して回転し、各車輪を個別のモータで駆動する独立車輪動力台車に用いる独立車輪駆動コンポーネントであって、

前記台車枠に支持されたモータの外周部を囲う状態で、ころがり軸受を介して回転自在に配置された車輪と、前記モータに対して軸方向にずれた位置で同軸配置されて、入力側が前記モータの出力軸に連結された減速機と、

前記車輪の側面のうち回転軸を中心とした円周上の位置に等配に形成された貫入孔と、

一端側が前記減速機の出力側に連結されると共に、他端側には前記貫入孔にそれぞれ貫入する複数のピン部材を有する伝達部材と、

前記伝達部材のピン部材と前記貫入孔との間に介在させた防振部材と、

前記モータと前記ころがり軸受との間、または、前記車輪と前記ころがり軸受との間の少なくとも一方に介在させた防振部材とで構成されていることを特徴とする鉄道車両用の独立車輪駆動コンポーネント。

【請求項 2】 台車枠に配置した右側の車輪と左側の車輪とが個別・独立して回転し、各車輪を個別のモータで駆動する独立車輪動力台車に用いる独立車輪駆動コンポーネントであって、

前記台車枠に支持されたモータの外周部を囲う状態で、ころがり軸受を介して回転自在に配置された車輪と、前記モータに対して軸方向にずれた位置で同軸配置されて、入力側が前記モータの出力軸に連結された減速機と、

前記車輪の側面のうち回転軸を中心とした円周上の位置に等配に形成された円形の貫入孔と、

一端側が前記減速機の出力側に連結されると共に、他端側には前記貫入孔にそれぞれ貫入する複数の円柱状のピン部材を有する伝達部材と、

前記伝達部材のピン部材と前記貫入孔との間に介在させたリング状の防振部材と、

前記モータと前記ころがり軸受との間、または、前記車輪と前記ころがり軸受との間の少なくとも一方に介在させた防振部材とで構成されていることを特徴とする鉄道車両用の独立車輪駆動コンポーネント。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】本発明は、鉄道車両用の独立車輪駆動コンポーネントに関するものである。本発明では、モータから車輪へのトルク伝達が確実にできると共に、車輪から発生した半径方向の振動が減速機やモータに伝達するのを低減することができるように工夫したものである。

## 【0002】

【従来の技術】現在の多くの鉄道車両用の動力台車では、右側の車輪と左側の車輪とが車軸により連結された一体型車輪を採用しており、台車に備えたモータの駆動力を、減速機により減速して、一体型車輪に伝達して走行をしている。曲線軌道を走行する場合には、車輪の踏面を利用したセルフステアリング効果により、曲線走行が可能となっている。

【0003】一方、最近では低床構造等を採用するために、独立車輪動力台車が開発されている。この独立車輪動力台車では、車軸を省略して右側の車輪と左側の車輪とを個別・独立して回転する構成にすると共に、各車輪を個別のモータにより駆動している。かかる独立車輪動力台車では、左右の車輪速度を同一としておけば、一体型車輪と同様に、上記セルフステアリング効果により曲線軌道を曲線走行することができる他、左右の車輪速度を異ならせることによっても曲線軌道を曲線走行することができる。

## 【0004】

【発明が解決しようとする課題】ところで、独立車輪動力台車では、車輪に隣接して減速機やモータを配置している。このため、車輪が軌道を走行する際に生ずる半径方向の振動が、減速機やモータに直接伝達してしまい、減速機やモータが大きな振動を受け、減速機やモータが劣化し易く寿命が短かった。

【0005】本発明は、上記従来技術に鑑み、モータから車輪へのトルク伝達が確実にできると共に、車輪から発生した半径方向の振動が減速機やモータに伝達するのを低減することができ、減速機やモータの振動・劣化を低減することができる、鉄道車両用の独立車輪駆動コンポーネントを提供することを目的とする。

## 【0006】

【課題を解決するための手段】上記課題を解決する本発明の構成は、台車枠に配置した右側の車輪と左側の車輪とが個別・独立して回転し、各車輪を個別のモータで駆動する独立車輪動力台車に用いる独立車輪駆動コンポーネントであって、前記台車枠に支持されたモータの外周部を囲う状態で、ころがり軸受を介して回転自在に配置された車輪と、前記モータに対して軸方向にずれた位置で同軸配置されて、入力側が前記モータの出力軸に連結された減速機と、前記車輪の側面のうち回転軸を中心とした円周上の位置に等配に形成された貫入孔と、一端側が前記減速機の出力側に連結されると共に、他端側には前記貫入孔にそれぞれ貫入する複数のピン部材を有する伝達部材と、前記伝達部材のピン部材と前記貫入孔との間に介在させた防振部材と、前記モータと前記ころがり軸受との間、または、前記車輪と前記ころがり軸受との間の少なくとも一方に介在させた防振部材とで構成されていることを特徴とする。

【0007】また本発明の構成は、台車枠に配置した右側の車輪と左側の車輪とが個別・独立して回転し、各車

輪を個別のモータで駆動する独立車輪動力台車に用いる独立車輪駆動コンポーネントであって、前記台車枠に支持されたモータの外周部を囲う状態で、ころがり軸受を介して回転自在に配置された車輪と、前記モータに対して軸方向にずれた位置で同軸配置されて、入力側が前記モータの出力軸に連結された減速機と、前記車輪の側面のうち回転軸を中心とした円周上の位置に等配に形成された円形の貫入孔と、一端側が前記減速機の出力側に連結されると共に、他端側には前記貫入孔にそれぞれ貫入する複数の円柱状のピン部材を有する伝達部材と、前記伝達部材のピン部材と前記貫入孔との間に介在させたリング状の防振部材と、前記モータと前記ころがり軸受との間、または、前記車輪と前記ころがり軸受との間の少なくとも一方に介在させた防振部材とで構成されていることを特徴とする。

#### 【0008】

【発明の実施の形態】以下に本発明の実施の形態を図面に基づき詳細に説明する。

【0009】図1は本発明の実施の形態にかかる独立車輪駆動コンポーネントを備えた独立車輪動力台車を示す構成図であり、図2は本実施の形態にかかる独立車輪駆動コンポーネントを示す断面図であり、図3は車輪の縦断面図であり、図4は防振部材を示す平面図である。

【0010】図1に示すように、鉄道車両用の独立車輪動力台車1の上には、空気ばね2を介して車体3が搭載される。独立車輪動力台車1の台車枠4の右側および左側には、個別・独立して回転駆動する左右のモータ11、11が配置されている。左右のモータ11、11の外周部には、ころがり軸受を介して、それぞれ車輪12、12が配置されている。モータ11、11の駆動力は、遊星減速機13、13を介して車輪12、12に伝達される。このように、台車枠4の左側および右側に備えたモータ11、11により、車輪12、12を個別に回転駆動することにより、レール5上を走行することができる。

【0011】上記モータ11、車輪12及び遊星減速機13を含めて、独立車輪駆動コンポーネント10が構成されている。この独立車輪駆動コンポーネント10を、図2～図4を参照して以下に説明する。

【0012】図2に示すように、モータ11は、その端面が台車枠4に固定・支持されている。しかも、モータ11の端面の周縁と、台車枠4との間には、防振部材14が介装されている。この防振部材14は、図4に示すような形状となっており、モータ11の端面の周縁形状に対応した形状となっている。つまり、モータ11の端面の周縁には、90度ピッチずれて、回り止めの突起が形成されているため、この突起に併せて、防振部材14にも突起部14aが形成されている。

【0013】モータ11の外周部には、ころがり軸受15を介して、車輪12が回転自在に配置されている。つ

まり、車輪12はモータ11の外周部を囲う状態で配置されている。しかも、モータ11の外周面と、ころがり軸受15の内輪との間には、防振部材16が介装されており、車輪12の内周面と、ころがり軸受15の外輪との間には、防振部材17が介装されている。

【0014】遊星減速機13は、モータ11に対して軸方向の外側（車幅方向の外側）にずれた位置で、モータ11の回転軸と同軸となるように配置されている。この遊星減速機13は、入力側がモータ11の出力軸11aに連結されている。

【0015】一方、図3に示すように、車輪12の側面には、複数個（本実施の形態では4個）の円形の貫入孔12aが形成されている。各貫入孔12aは、車輪12の回転軸を中心とした円周上の位置に等配に（90°ピッチずれて）形成されている。

【0016】図2に戻り説明すると、伝達部材18は、遊星減速機13と車輪12との間の位置に配置されている。この伝達部材18は、その一端側部分（図2では右側部分）18aが、遊星減速機15の出力側に連結されており、その他端側（図2では左側）には、複数本（本実施の形態では4本）の円柱状のピン部材18bを有している。各（4本の）ピン部材18bは、90°ピッチずれて形成されており、車輪12に形成した貫入孔12aにそれぞれ貫入されている。

【0017】更に、図2及び図3に示すように、貫入孔12aとピン部材18bとの間には、リング状の防振部材19が介装されている。

【0018】各防振部材14、16、17、19としては、硬度が60度程度のゴム等が使用される。

【0019】また、遊星減速機13には、その開口部にシール20が設けられている。

【0020】上記構成となっている独立車輪駆動コンポーネント10では、モータ11が回転駆動すると、回転力は遊星減速機13にて減速され、伝達部材18を介して車輪12に伝達し、車輪12が回転する。駆動力が伝達部材18から車輪12に伝達する際には、ピン部材18bと貫入孔12aとの間の防振部材19は、周方向に圧縮される。防振部材19は、圧縮力に対しては強いいため、駆動力が確実に車輪12に伝達される。

【0021】一方、車輪12がレール上を走行すると、車輪12の半径方向に振動が発生する。この半径方向の振動は、主に防振部材16、17により振動が低減されてから、モータ11に伝達する。このため、車輪12から発生してモータ11に伝達される半径方向の振動は低減し、モータ11の故障・劣化が低減して寿命を延ばすことができる。

【0022】また、車輪12の振動は、防振部材19により振動が低減されてから、伝達部材18を介して遊星減速機13に伝達する。このため、車輪12から発生して遊星減速機13に伝達される振動は低減し、遊星減速

機 13 の故障・劣化が低減して寿命を延ばすことができる。

【0023】また、防振部材 14 によっても、車輪振動が遊星減速機 13 やモータ 11 に伝達するのを低減することができる。また、防振部材 14 によって、車輪振動が台車 1 に伝達するのを低減し、ひいては車体 3 への振動伝達が低減でき、乗り心地を良くするように配慮している。なお、上記実施の形態では、防振部材 14 を備えているが、場合によっては防振部材 14 を備えない構成としても良い。

【0024】なお、貫入孔 12a の形状は、円形でなくても良く、多角形の孔としてもよい。その場合には、ピン部材 18b を多角柱状とすると共に、防振部材 19 を多角形のリング形状とする。

【0025】また、上記実施の形態では、防振部材 16 及び防振部材 17 を備えているが、モータ 11 ところがり軸受 15 との間、または、車輪 12 ところがり軸受 15 との間の少なくとも一方に、防振部材を介在させるような構成としても良い。

#### 【0026】

【発明の効果】以上実施の形態と共に具体的に説明したように、本発明では台車枠に配置した右側の車輪と左側の車輪とが個別・独立して回転し、各車輪を個別のモータで駆動する独立車輪動力台車に用いる独立車輪駆動コンポーネントであって、前記台車枠に支持されたモータの外周部を囲う状態で、ころがり軸受を介して回転自在に配置された車輪と、前記モータに対して軸方向にずれた位置で同軸配置されて、入力側が前記モータの出力軸に連結された減速機と、前記車輪の側面のうち回転軸を中心とした円周上の位置に等配に形成された貫入孔と、一端側が前記減速機の出力側に連結されると共に、他端側には前記貫入孔にそれぞれ貫入する複数のピン部材を有する伝達部材と、前記伝達部材のピン部材と前記貫入孔との間に介在させた防振部材と、前記モータと前記ころがり軸受との間、または、前記車輪と前記ころがり軸受との間の少なくとも一方に介在させた防振部材とで構成した。

【0027】また本発明では、台車枠に配置した右側の車輪と左側の車輪とが個別・独立して回転し、各車輪を個別のモータで駆動する独立車輪動力台車に用いる独立車輪駆動コンポーネントであって、前記台車枠に支持されたモータの外周部を囲う状態で、ころがり軸受を介して回転自在に配置された車輪と、前記モータに対して軸方向にずれた位置で同軸配置されて、入力側が前記モータの出力軸に連結された減速機と、前記車輪の側面のうち回転軸を中心とした円周上の位置に等配に形成された円形の貫入孔と、一端側が前記減速機の出力側に連結されると共に、他端側には前記貫入孔にそれぞれ貫入する複数の円柱状のピン部材を有する伝達部材と、前記伝達

部材のピン部材と前記貫入孔との間に介在させたリング状の防振部材と、前記モータと前記ころがり軸受との間、または、前記車輪と前記ころがり軸受との間の少なくとも一方に介在させた防振部材とで構成した。

【0028】上記構成としたため、本発明では、車輪に発生した半径方向の振動を、モータところがり軸受との間、または、車輪ところがり軸受との間に介装した防振部材により低減することができ、これにより、車輪から発生した半径方向の振動がモータに伝達するのを低減することができ、モータの振動・劣化を低減することができる。この結果、モータの寿命を延ばすことができる。

【0029】また、本発明では、車輪に発生した振動を、貫入孔とピン部材との間に介装した防振部材により低減することができ、これにより、車輪から発生した振動が減速機に伝達するのを低減することができ、減速機の振動・劣化を低減することができる。この結果、減速機の寿命を延ばすことができる。

【0030】また、駆動力が伝達部材から車輪に伝達する際には、ピン部材と貫入孔との間の防振部材は、周方向に圧縮されるため、駆動力は確実に車輪に伝達される。

#### 【図面の簡単な説明】

【図 1】本発明の実施の形態にかかる独立車輪駆動コンポーネントを備えた独立車輪動力台車を示す構成図。

【図 2】本発明の実施の形態にかかる独立車輪駆動コンポーネントを示す断面図。

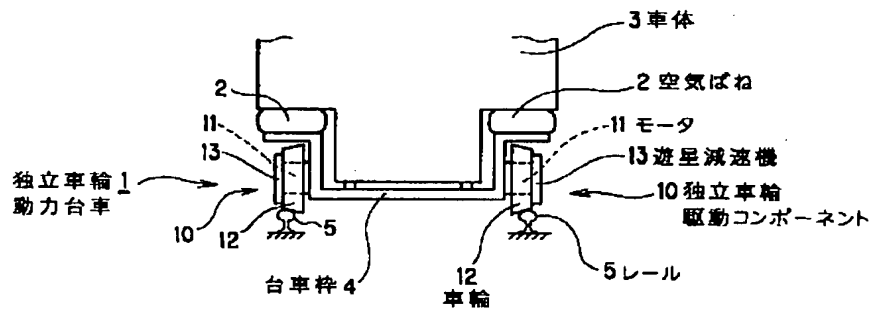
【図 3】車輪の縦断面を示す断面図。

【図 4】防振部材を示す平面図。

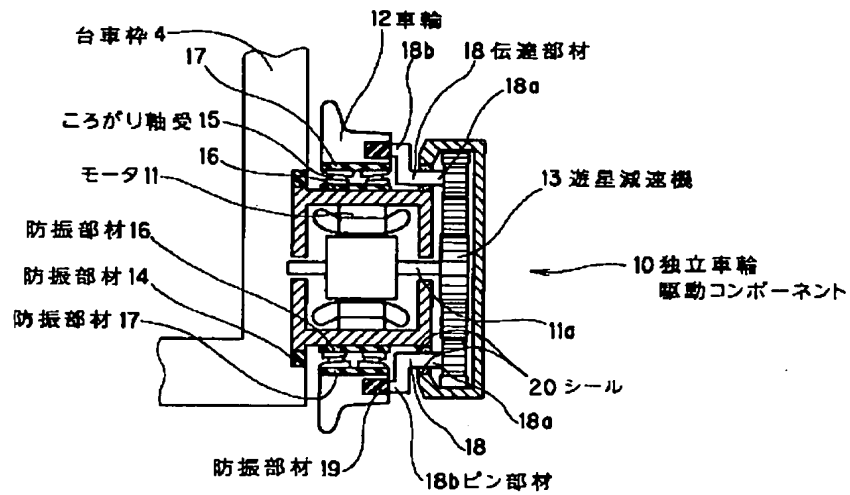
#### 【符号の説明】

- |     |               |
|-----|---------------|
| 1   | 独立車輪動力台車      |
| 2   | 空気ばね          |
| 3   | 車体            |
| 4   | 台車枠           |
| 5   | レール           |
| 10  | 独立車輪駆動コンポーネント |
| 11  | モータ           |
| 11a | 出力軸           |
| 12  | 車輪            |
| 13  | 遊星減速機         |
| 14  | 防振部材          |
| 14a | 突起部           |
| 15  | ころがり軸受        |
| 16  | 防振部材          |
| 17  | 防振部材          |
| 18  | 伝達部材          |
| 18a | 一端側部分         |
| 18b | ピン部材          |
| 19  | 防振部材          |
| 20  | シール           |

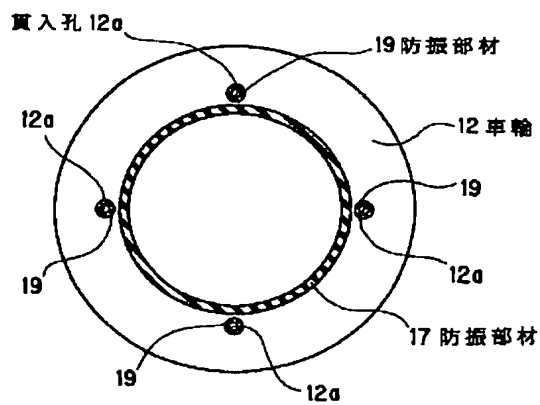
【図1】



【図2】



【図3】



【図4】

